

Message Text

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DRAFTED BY IAEA VIENNA:ALABOWITZ/USERDA AIA:NFSIEVERING,JR
APPROVED BY OES/NET/IM: D B HOYLE
ACDA: MR. OYSTER
EUR/RPE: MR. SALISBURY
PM/NPP: MR. MCGUINNESS
T/D - MR. MCGAFFIGAN
-----171119Z 034921 /15

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FM SECSTATE WASHDC
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INFO USMISSION IAEA VIENNA
AMEMBASSY LONDON
AMEMBASSY BONN
AMEMBASSY MOSCOW
AMEMBASSY BRUSSELS
USMISSION EC BRUSSELS
AMEMBASSY ROME
AMEMBASSY OTTAWA
AMEMBASSY TOKYO

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TAGS: TECH, IAEA, FR

SUBJECT: ANNOUNCEMENT AT IAEA SALZBURG CONFERENCE BY FRANCE
OF NEW URANIUM ENRICHMENT PROCESS

1. FOLLOWING IS REPORT BY USDEL RE SUBJECT ANNOUNCE-
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MENT: SUMMARY: SUBJECT ANNOUNCEMENT, RUMORED FOR SEVERAL
DAYS AT SALZBURG, WAS MADE BY CEA HEAD GIRAUD DURING
PRESENTATION OF HIS SCHEDULED PAPER DURING PLENARY SESSION
FRIDAY, AM, MAY 6, FOLLOWED BY PRESS CONFERENCE BY GIRAUD,
ACCOMPANIED BY FREJACQUES AND COATES THAT AFTERNOON. NO
TECHNICAL DETAILS OF PROCESS, DESCRIBED ONLY AS CHEMICAL
"EXCHANGE" OR "TREATMENT", WERE PROVIDED, DESPITE REPEATED
REQUESTS DURING BOTH PLENARY QUESTION PERIOD AND PRESS
CONFERENCES. IN ABSENCE OF DETAILS, FRENCH CLAIM THAT
PROCESS IS "PROLIFERATION PROOF" (AND THUS NOT REPEAT NOT

"SENSITIVE TECHNOLOGY") MUST BE VIEWED WITH SKEPTICISM.
INTENT OF FRENCH ANNOUNCEMENT IS CLEARLY TO OPEN DISCUSSION
AND HOPEFULLY OBTAIN CONFIRMATION BY OTHER GOVERNMENTS,
ESPECIALLY THOSE DEDICATED TO NON-PROLIFERATION, OF
"PROLIFERATION-PROOF" CHARACTER OF PROCESS AND CONCURRENCE
IN MAKING PROCESS AVAILABLE, IN DUE COURSE, TO NNWS'S.
END SUMMARY.

2. FIRST INDICATION THAT FRANCE WOULD BE ANNOUNCING
SUCCESSFUL DEVELOPMENT OF NEW URANIUM ENRICHMENT PROCESS
WAS REPORT BY MEMBERS OF IAEA SECRETARIAT LATE DURING
OPENING DAY OF CONFERENCE THAT SUCH REVELATION WOULD BE
MADE BY C. FREJAQUES ET AL, OF CEA, IN PRESENTATION
SCHEDULED FOR NEXT DAY, MAY 3, DURING TECHNICAL SESSION.
FREJACQUES PRESENTATION, HOWEVER, MERELY INCLUDED ONE-PAGE
DISCUSSION OF CHEMICAL EXCHANGE TECHNIQUE AMONG VARIOUS
TECHNIQUES STUDIED IN FRANCE: GASEOUS DIFFUSION, GAS
CENTRIFUGE, AERODYNAMIC METHODS SUCH AS "JET MEMBRANE"
AND SONICS, CHEMICAL EXCHANGE, PHOTOCHEMICAL EXCITATION,
IONIC AND ELECTROMAGNETIC, IN THAT ORDER. DESCRIPTION OF
CHEMICAL EXCHANGE PROCESS GIVEN IN PAPER (IAEA-CN-36/FR/
257, COPY HAND-CARRIED BY P. VANSTRUM, UNION CARBIDE, OAK
RIDGE) IS IN GENERAL TERMS AND REFERS TO STUDIES IN FRANCE
PRINCIPALLY RELATED TO EXCHANGE BETWEEN PHASES CONTAINING
URANIUM OF DIFFERENT VALENCES. PAPER MENTIONS THAT
CHEMICAL EXCHANGE PROCESSES ARE CHARACTERIZED BY LESS
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SOPHISTICATED TECHNOLOGY THAN OTHER METHODS AND ARE EASILY
INDUSTRIALIZED ON LARGE SCALE. PROCESS CONSUMES ENERGY
NOTABLY IN CIRCULATION AND MIXING OF PHASES AND IN
REFLUXING, MOST OFTEN BY ELECTROCHEMICAL MEANS. PROCESS
IS HANDICAPPED BY SUBSTANTIAL URANIUM INVENTORY IN
EQUIPMENT. MOST IMPORTANT FACTORS ARE EQUILIBRIUM TIME AND
ENERGY REQUIRED FOR REFLUX. DATA IN TABLE IN PAPER
COMPARES LIQUID-LIQUID U-IV/U-VI EXCHANGE, GAS-LIQUID
U-V/U-VI EXCHANGE AND SYSTEM USING RESINS FOR U-IV/U-VI
EXCHANGE, GIVING EQUILIBRIUM TIMES PER STAGE OF 2 TO 3
MINUTES, 30 TO 40 SECONDS AND 40 TO 60 SECONDS
RESPECTIVELY. REFLUX IS CHARACTERIZED AS "EASY,"
"DIFFICULT," AND "POSSIBLE" RESPECTIVELY. PAPER STATES THAT
A NEW PROCESS UTILIZING "DES COMPOSES COURONNES" OF
URANIUM IS ACTUALLY UNDER STUDY. COMMENT: DEL UNABLE
TRANSLATE TECHNICAL SIGNIFICANCE QUOTED PHRASE. END
COMMENT. METHOD SUMMARIZED IN PAPER BY NOTING THAT IT IS
VERY ATTRACTIVE FROM THE POINT OF VIEW OF DISSEMINATION
IN THAT PROBLEMS OF CRITICALITY IN LIQUID PHASES, WILL NOT
PERMIT THE LARGE COLUMNS USED FOR PRODUCTION OF 3 PER CENT
U-235, TO BE USED FOR PRODUCTION OF HIGHLY ENRICHED
URANIUM. MOREOVER, EQUILIBRIUM TIME NECESSARY TO REACH
90 PER CENT IS PROHIBITIVE, WHILE THAT FOR 3 PER CENT

WILL PROBABLY BE VERY ACCEPTABLE. DATA IN PAPER GIVE EQUILIBRIUM TIMES AS SHORT AS 1.1 YEAR FOR 3 PER CENT AND "MORE THAN TEN YEARS" FOR 90 PER CENT. COMMENT: IT IS UNCLEAR WHETHER REFERENCE IS TO SAME EQUIPMENT IN EACH CASE, WHEN REFERRING TO EQUILIBRIUM TIMES, BUT REFERENCE NOTED ABOVE TO CRITICALITY PROBLEMS CLEARLY REFER TO

SAME EQUIPMENT FOR BOTH 3 PERCENT AND 90 PERCENT. END COMMENT. PAPER CONCLUDES WITH STATEMENT THAT CENTRIFUGE, LASER, AERODYNAMIC PROCESSES AND CHEMICAL EXCHANGE METHODS WILL PROBABLY BE SERIOUS COMPETITORS TO GASEOUS DIFFUSION DURING THE NEXT DECADE. FROM POINT OF VIEW OF DISSEMINATION, CHEMICAL EXCHANGE PROCESSES CAN GIVE LIMITED OFFICIAL USE

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A SATISFACTORY SOLUTION TO COUNTRIES DESIRING INDEPENDENCE IN SUPPLY OF NUCLEAR FUEL, WHILE GAS CENTRIFUGE AND LASER TECHNIQUES, ON THE OTHER HAND, POSE SERIOUS PROBLEMS.

3. AT THE END OF HIS SCHEDULED PRESENTATION IN PLENARY FRIDAY A.M. MAY 6 (ENTITLED: THE NUCLEAR FUEL CYCLE: ENCOURAGING AND LESS ENCOURAGING ASPECTS") A. GIRAUD ANNOUNCED THAT, IN COURSE OF TEN YEARS OF STUDY IN FRENCH LABORATORIES, PROCESS BASED UPON CHEMICAL EXCHANGE HAD BEEN DEVELOPED TO STAGE WHERE DEMONSTRATION PLANT OF FIFTY STAGES WAS PLANNED. PROCESS, WHILE APPEARING GOOD CANDIDATE FOR PRODUCTION OF LOW-ENRICHED URANIUM WAS UNSUITABLE FOR HIGHLY-ENRICHED URANIUM BECAUSE OF THREE CHARACTERISTICS:

(A) PROCESS CASCADE OPERATES IN SERIES SUCH THAT IT IS DIFFICULT, IF NOT IMPOSSIBLE, TO REARRANGE PIPING IN ORDER TO ACHIEVE HIGH ENRICHMENT;

(B) PROCESS UTILIZES LIQUID PHASE AND THUS CRITICALITY CONSIDERATIONS PREVENT USE OF EQUIPMENT FOR HIGH ENRICHMENT; AND

(C) WHEREAS EQUILIBRIUM TIME FOR 3 PERCENT IS "COMPATIBLE" WITH CONSTRUCTION TIME, TIME TO REACH EQUILIBRIUM FOR 90 PERCENT URANIUM IS THIRTY YEARS.

FRANCE WAS OPEN TO INTERNATIONAL PARTICIPATION IN MOVING TO DEMONSTRATION PLANT FOR PROCESS WHICH APPEARS TO BE WITHIN COMPETITIVE RANGE WITH GASEOUS DIFFUSION, ALTHOUGH POSSIBLE OPTIMISTIC ECONOMICS WILL NEED TO BE CONFIRMED. DURING QUESTION PERIOD, GIRAUD RESPONDED BY NOTING THAT EXPRESSIONS OF INTEREST BY GOVERNMENTS WERE BEING SOLICITED SINCE RESPONSIBILITY FOR MAKING PROCESS TECHNOLOGY AVAILABLE GENERALLY IS MORE THAN FRANCE CAN CARRY

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ALONE. RISK OF PROLIFERATION IN SPENT FUEL REPROCESSING IS LESS THAN THAT OF PRODUCTION OF HIGHLY ENRICHED URANIUM. IF NEW FRENCH PROCESS IS SHOWN TO HAVE APPARENT CHARACTERISTICS, TECHNOLOGY WILL NOT REPEAT NOT BE

"SENSITIVE". LIMITED INFORMATION, SUCH AS PRESENTED AT CONFERENCE, HAD ALREADY BEEN GIVEN TO EURODIF PARTNERS. NUCLEAR ENERGY IS NECESSARY FOR THE WORLD AND PROCESS GIVES OPPORTUNITY TO COUNTRIES TO PROVIDE THEIR OWN FUEL WITHOUT RISK OF PROLIFERATION. PROCESS REQUIRES ONE-THIRD OF ELECTRIC POWER REQUIRED FOR GASEOUS DIFFUSION, BUT WILL PROBABLY NOT COMPETE WITH LATTER AT LEAST INITIALLY, ALTHOUGH POTENTIAL FOR IMPROVEMENT IS THERE. STATUS OF DEVELOPMENT OF TECHNOLOGY IS COMPARABLE TO CENTRIFUGE AT PRESENT. MOREOVER, PROCESS EQUIPMENT IS SIMPLER THAN GASEOUS DIFFUSION AND INCURS NO PENALTY OF SCALE. CONSTRUCTION OF DEMONSTRATION PLANT PLANNED TO BEGIN IN 1979, TO BE UNDERTAKEN BY FRANCE ALONG OR WITH "COOPERATION" OF OTHER GOVERNMENTS WITH DECISION REGARDING COMMERCIALIZATION FORESEEN ONLY IN LATE 1980'S.

4. AT PRESS CONFERENCE MID-AFTERNOON SAME DAY, RELEASE, IN BOTH FRENCH AND ENGLISH TEXTS, WAS HANDED OUT TO SRO CROWD. (ENGLISH TEXT TRANSMITTED SEPTEL). QUESTIONS SIMILAR TO THOSE ASKED IN PLENARY WERE REPEATED, THIS TIME BY REPORTERS. GIRAUD RESPONDED WITH GRACE AND CHARM, STILL REFUSING TO GIVE ANY TECHNICAL DETAILS. HE STATED REASON FOR ANNOUNCEMENT WAS TO OFFER ENRICHMENT PROCESS, IN LIGHT NECESSITY FOR NUCLEAR POWER, WHICH WAS COMPATIBLE WITH GOF CONCERN RE PROLIFERATION. REACTION FROM OTHER GOVERNMENTS WAS WANTED BEFORE TECHNICAL DETAILS WERE REVEALED, IN LIGHT GREAT RESPONSIBILITY. DEMONSTRATION PLANT WITH SEPARATION CAPACITY OF 50 TO 200 TONS. PROCESS WAS NOT UNDER CONSIDERATION BY EURODIF OR COREDIF, SINCE TIME FOR
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DECISION THOSE ENTERPRISES WILL NOT PERMIT ECONOMICS OF NEW PROCESS TO BE CONFIRMED. THUS, GASEOUS DIFFUSION REMAINS MOST ECONOMIC PROCESS AT PRESENT. IN RESPONSE TO QUESTION AS TO WHETHER TECHNOLOGY OF NEW PROCESS WOULD BE EXPORTED, GIRAUD SAID TECHNOLOGY WOULD NOT BE "SENSITIVE" AND THUS EXPORTED NOT PRECLUDED. OTHER QUESTIONS PROVOKED RESPONSES THAT FRANCE HAS STUDIED AND CONTINUING SMALL EFFORT ON CENTRIFUGE PROCESS BUT

CANNOT AFFORD DEMONSTRATION PLANT AND MORE EFFORT DURING PAST TEN YEARS HAS BEEN DEVOTED TO CHEMICAL EXCHANGE PROCESS. QUESTIONS RE LOCATION OF PILOT PLANTS BROUGHT

RESPONSE THAT TECHNIQUE IS "DELICATE" SO LOCATION WOULD NOT BE GIVEN. TWO TYPES OF PILOT PLANTS HAVE BEEN OPERATED, IN 1975 AND 1976 AT GREATER THAN 90 PERCENT AVAILABILITY. IN ONE TYPE, A NUMBER OF SMALL STAGES HAVE BEEN OPERATED IN CASCADE IN ORDER TO VERIFY PRINCIPLE INVOLVED. IN OTHERS, SINGLE LARGER STAGES HAVE BEEN OPERATED TO STUDY TECHNOLOGY. SIX OR SEVEN DIFFERENT CHEMICAL EXCHANGE SYSTEMS HAVE BEEN STUDIED. PROBLEMS ARE NOT RELATED TO TECHNICAL DETAILS.

5. U.S. DELEGATION SUGGESTS THAT "PROLIFERATION-PROOF" CHARACTERISTICS BE VIEWED WITH SKEPTICISM AT MOMENT. IT IS NOT CLEAR WHY PROCESS TECHNOLOGY INVOLVED COULD NOT BE APPLIED IN DESIGN OF PLANT UTILIZING SMALLER, SPECIALLY DESIGNED EQUIPMENT SUITABLE FROM CRITICALITY STANDPOINT AND INVENTORY (WHICH IS PRINCIPAL FACTOR IN EQUILIBRIUM TIME) TO PRODUCTION OF HIGHLY ENRICHED URANIUM. RELATIVELY FEW TECHNICAL DETAILS WOULD PERMIT EVALUATION OF PROCESS IN THAT REGARD. THOSE SAME DETAILS WOULD ALSO PERMIT PRELIMINARY ESTIMATE OF ECONOMICS OF PROCESS. CHRISTOPHER

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